REMARKS

Claim Amendments:

The amendment to Claim 1 is supported in the specification on page 1, lines 18-19; page 39, lines 5-8, page 2, lines 17-19; pages 43-48, and the Examples. New Claims 73-78 are supported in the specification on pages 3 and 6, and pages 44-47, for example. The remaining amendments are believed to be primarily clerical in nature.

Supplemental Amendment:

Applicants note that a Supplemental Amendment was filed in this application on March 5, 2003, that added Claims 66-72, but the Amendment does not appear to have been considered in the April 15 Office Action. A review of the U.S. Patent Office PAIR system shows that the Supplemental Amendment was received by the Patent Office on March 10, but may not have actually been forwarded to the Examiner until April 28. Nonetheless, the claims presented above assume the entry of the Supplemental Amendment and all amendments and remarks presented herein are intended to address the Examiner's concerns with regard to the claims pending as of April 15, and to take into account any rejections that would have presumably extended to the added Claims 66-72.

Objection to the Specification and Rejection of Claims 18-20 and 57-65 Under 35 U.S.C. § 112, First Paragraph:

The Examiner has objected to the specification and rejected Claims 18-20 and 57-65 under 35 U.S.C. § 112, first paragraph, contending that these claims are not enabled with regard to SEQ ID NO:4. Specifically, the Examiner submits that it is not clear from the specification that the protein having SEQ ID NO:4 contains an EF-hand consensus sequence which is alleged to be necessary for altering ABA ion channel function. Therefore, the Examiner contends that the ability to affect ABA mediated control of ion channels can not be predictably assigned to SEQ ID NO:4.

In order to expedite prosecution, and without any intention of addressing or presenting a position regarding the function of the protein having SEQ ID NO:4, Applicants have removed SEQ

ID NO:4 from the pending claims. Applicants expressly reserve the right to pursue the subject matter related to SEQ ID NO:4 in a continuation application.

In view of the foregoing remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claims 18-20 and 57-65 under 35 U.S.C. § 112, first paragraph.

Objection to the Specification and Rejection of Claims 1, 2, 13-18, 20, 57-60, 64 and 65 Under 35 U.S.C. § 112, First Paragraph:

The Examiner has objected to the specification and rejected Claims 1, 2, 13-18, 20, 57-60, 64 and 65 under 35 U.S.C. § 112, first paragraph, on the basis of written description. Specifically, the Examiner contends that the specification does not describe proteins that increase or augment the ABA mediated control of ion channels. The Examiner asks how a protein that augments ABA mediated control of ion channels differs from a protein that inhibits or attenuates the same ABA function. The Examiner further contends that the specification does not describe variants of SEQ ID NO:2 that have the ability to increase ABA mediated control of ion channels. Furthermore, the Examiner asserts that the specification does not teach a mammalian protein responsive to ABA as set forth in Claim 17.

Initially, Applicants note that the protein claimed by the present invention (SYR) plays a key role in mediating the signalling evoked by ABA, and it is clear from the description that the native protein and biologically active fragments or variants thereof can be used to affect or participate in, as well as increase or augment, the ABA-mediated control of ion channels. The protein of the present invention is involved in an ABA signalling complex. As discussed on page 44, under normal conditions, the affect of ABA is to regulate ion channels (e.g., either up- or down-regulate, depending on the particular channel). The expression of the SYR protein of the present invention (e.g., SEQ ID NO:2) has been shown by the present inventors to be regulated by ABA, and the SYR protein has been shown to participate in the control of ion channels that is mediated by ABA. For example, when the expression of the SYR protein of the invention was knocked out (see page 47-48), the response of the plant cells to ABA was lost. Similarly, when botulinum toxin was used to disable the SYR protein of the invention, ion channels showed a loss of sensitivity to regulation by ABA (see pages 44-47 and Example 27). Additionally, the effects of SYR expression in oocytes (or

blocking of the same) on particular ion channel activity was demonstrated, for example, in Examples 18 and 19. Finally, overexpression of SYR in transformed plants increases sensitivity to ABA (Example 35). Therefore, the SYR protein of the present invention, including biologically active fragments and variants thereof, facilitates, allows, or even augments ABA signalling because the presence of the functional SYR protein appears to be required for normal ABA signalling. As such, fragments and variants of SYR that are effectively agonists or antagonists of the native SYR will either facilitate or augment, or inhibit ABA signalling, respectively. Nonetheless, Claim 1 has been amended to clarify the invention and to refer to proteins that allow ABA signalling.

Moreover, as mentioned above, by identification of the SYR protein in plants, the present invention has also provided SYR proteins that inhibit ABA mediated control of ion channels. For example, such proteins would be fragments or variants of the native protein that have an inhibitory effect rather than the normal activity of the native protein (e.g., a competitive inhibitor of the native protein). The specification describes one such protein of the invention, which is a truncated syntaxin protein (i.e., a fragment). When the truncated protein was used in the experiments that are summarized on pages 44-47 of the specification (and detailed in the Examples), the truncated protein inhibited the sensitivity of the ion channels to ABA. To clarify this aspect of the invention, new Claims 73-78 have been added to recite SYR variants that inhibit the ABA response.

With regard to the claimed fragments and variants, Applicants submit that the specification provides sufficient written description because the specification and claims put limitations on the number of changes that can be made to the claimed fragments and variants both in terms of structure and function, and because of the provision in the specification of assays for testing for SYR variants that participate in ABA signalling, as well as inhibit ABA signalling (examples have been discussed above). The specification provides a description for determining percent homology to other proteins, identifies proteins homologous to the SYR protein represented by SEQ ID NO:2, and furthermore, the specification provides detailed guidance to those of skill in the art regarding the structural features of a SYR protein of the invention, including where these features are located with regard to SEQ ID NO:2, that would readily allow one of skill in the art to recognize what changes could be made to a given SYR protein that would allow for the production of a biologically active SYR

variant. The specification also describes a SYR variant that inhibits ABA signalling, providing guidance as to what changes can be made to the protein to allow this functionality.

With regard to Claim 17, Applicants have removed reference to a mammalian protein to expedite prosecution.

In view of the foregoing amendments and remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claims 1, 2, 13-18, 20, 57-60, 64 and 65 under 35 U.S.C. § 112, first paragraph.

Rejection of Claim 19 Under 35 U.S.C. § 112, First Paragraph:

The Examiner has rejected Claim 19 under 35 U.S.C. § 112, first paragraph, as presenting new matter. The Examiner asserts that the specification at pages 5-6 refers to two hybrid systems involving fusion proteins and recombinant technology, whereas Claim 19 is directed to a binding assay between two proteins which the Examiner contends is not set forth in the specification.

Applicants traverse the rejection of Claim 19 under 35 U.S.C. § 112, first paragraph. Claim 19 recites a screening assay for protein-protein interactions. However, this is exactly what the description on pages 5-6 describes. Referring to this paragraph:

> The protein of the present invention may be used in screens to detect protein-protein interactions. In particular, the protein may be used to screen for other members of a signal transduction pathway. One suitable method is the so-called two-hybrid system....

The two-hybrid system is only one method by which protein-protein interactions can be evaluated and furthermore, it is respectfully noted that a two-hybrid system uses binding or interaction between two proteins as a read-out. Therefore, it is submitted that Claim 19 does not contain new matter.

In view of the foregoing remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claim 19 under 35 U.S.C. § 112, first paragraph.

Rejection of Claims 1, 2, 4-20, 64 and 65 Under 35 U.S.C. § 112, Second Paragraph:

The Examiner has rejected Claims 1, 2, 4-20, 64 and 65 under 35 U.S.C. § 112, second paragraph, contending that these claims are indefinite.

The Examiner contends that Claim 1 refers to variants and that with the broad structural language, it is not clear what a variant of a structure is. To expedite prosecution, Applicants have removed the language found objectionable by the Examiner.

With regard to Claim 19, the Examiner contends that it is not clear how the method is "isolated." Claim 19 has been amended to remove the unnecessary term "isolated."

With regard to Claim 20, the Examiner contends that it is not clear which protein is selected. Claim 20 has been amended to clarify that it is the ABA signalling component protein that is being selected.

The Examiner also asserts that Claims 5, 7 and 9 broaden the claims from which they depend. To address this issue, each of Claims 5, 7 and 9 have been amended to depend from Claim 1, which obviates the rejection.

Finally, the Examiner asserts that Claim 11 does not have antecedent basis to specify the specifically recited amino acids, and particularly position 120, which allegedly lies outside the NBS specified as 114-119 of SEQ ID NO:2. Applicants traverse this rejection. Initially, Applicants note that Claim 11 depends from Claim 1, and there is sufficient antecedent basis provided in Claim 1 for Claim 11, as Claim 1 does not refer to any particular amino acid positions. With regard to the specification, the Examiner is respectfully directed to the bottom third of page 2, where amino acid positions 116, 118 and 120 are described as one of two alternatives for the nucleotide binding site of SEQ ID NO:2.

In view of the foregoing discussion, Applicants respectfully request that the Examiner withdraw the rejection of Claims 1, 2, 4-20, 64 and 65 under 35 U.S.C. § 112, second paragraph.

Rejection of Claims 1, 17 and 20 Under 35 U.S.C. § 102(b):

The Examiner has rejected Claims 1, 17 and 20 under 35 U.S.C. § 102(b), contending that these claims are anticipated by Leung et al. The Examiner contends that Leung et al. teach *Arabidopsis* ABA response gene product ABI1 that is from a plant, that allegedly comprises an EF

hand sequence and is capable of mediating ABA mediated control of ion channels, and that may interact with $p34^{cdc2}$. Therefore, the Examiner asserts that the protein of Leung et al. anticipates a biologically active fragment or variant of Claim 1 (as well as Claims 17 and 20).

Initially, Applicants submit that the protein of Leung et al., which is a full-length protein, is not a fragment or a variant of the protein described in Claim 1 but rather is a phosphatase that may have some structural similarities to the protein of Claim 1. However, to expedite prosecution, Applicants have amended Claim 1 to remove the reference to a biologically active fragment or variant.

In view of the foregoing amendments and remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claims 1, 17 and 20 under 35 U.S.C. § 102(b).

Applicants have attempted to address all of the issues as set forth in the April 15 Office Action. Applicants appreciate the guidance provided by the Examiner with regard to allowable subject matter, and submit that the pending claims are in a condition for allowance. In the event that the Examiner has any remaining concerns regarding the claims, she is encouraged to contact the below-named agent to discuss such concerns.

Respectfully submitted,

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